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09/891,589	06/27/2001	Kiichiro Takahashi	684.3203	2104

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EXAMINER

LIANG, LEONARD S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/891,589	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	Leonard S Liang	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☒ Claim(s) 1,3,8,12,17,19 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 120. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 2, 9-12, 14-18, 27, 30, 112, 160, S33, and S46. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: On page 3, lines 15-17; the specification states "Therefore, a method of avoiding the banding in one-path printing, thus improving the image quality." This is a minor grammar error. It will be construed that the specification should read, "Therefore, a method of avoiding the banding in one-path printing is **disclosed**, thus improving the image quality. Appropriate correction is required.
4. The disclosure is objected to because of the following informalities: On page 10, lines 17-19; the specification states "Figures 16A-C are schematically illustration of a recording head according to a second embodiment of the present invention." This is a minor grammar error. It will be construed that the specification should read, "Figures 16A-C **schematically illustrate** a recording head according to a second embodiment of the present invention." Appropriate correction is required.

5. The disclosure is objected to because of the following informalities: On page 17, line 16; the specification states “the use of the thinning rate12.5%.” This is a minor grammar error. It will be construed that the specification should read, “the use of the **thinning rate 12.5%**.” Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: On page 18, line 6; the specification states “In order to enhance the resolving power for each of the parameter...” This is a minor grammar error. It will be construed that the specification should read, “In order to enhance the resolving power for each of the parameters...” Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: On page 44, line 25; the specification states, “dot count of UC divided by 2 and the sun of the dot.” The phrase “sun of the dot” does not have a clearly disclosed meaning. It will be construed that the specification should read, “the specification states, “dot count of UC divided by 2 and the **sum** of the dot.” Appropriate correction is required.

Claim Objections

8. Claims 1-3, and 8 objected to because of the following informalities: The phrase “control means for controlling an amount of being to be ejected to the unit area on the basis of the output of said obtaining means” does not make sense. It will be construed that the claim should be stated “control means for controlling an amount of **ink** to be ejected to the unit area on the basis of the output of said obtaining means.” Appropriate correction is required.

9. Claim 12 is objected to because of the following informalities: Claim 12 discloses “An apparatus according to Claim 11, wherein said thinning area...” However, there is no thinning area explicitly disclosed in claim 11. There are unit areas disclosed, as well as a “thinning means for effecting a thinning process to the ink ejection data for an area to be thinned in the unit area on the basis of a thinning rate determined by said determining means.” Therefore, it will be construed that claim 12 should be stated, “An apparatus according to claim 11, wherein said **unit**

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area is divided into a plurality of areas for each of which the thinning rate is determined, and said thinning means effects the thinning process on the basis of the thinning rate determined for each of the areas.” Appropriate correction is required.

10. Claim 17 objected to because of the following informalities: The phrase “An ink jet recording apparatus...said **in** jet recording apparatus comprising...” does not make sense. It will be construed that the claim should be stated, “An ink jet recording apparatus... said **ink** jet recording apparatus comprising.” Appropriate correction is required.

11. Claim 19 is objected to because of the following informalities: Claim 19 discloses “**An apparatus** according to claim 2...” However, claim 2 is directed to an ink jet recording method, not an apparatus. It will be construed that claim 19 should be stated, “**An ink jet recording method** according to claim 2...” Appropriate correction is required.

12. Claim 22 is objected to because of the following informalities: Claim 22 discloses “**An apparatus** according to claim 21...” However, claim 21 is directed to a method of correcting image data for an ink jet recording apparatus, not the apparatus itself. It will be construed that claim 19 should be stated, “**A method of correcting image data for an ink jet recording apparatus** according to claim 21...” Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent basis for “said correcting means” in claim 1. It will be construed that the claim should be stated “An apparatus according to **Claim 17...**”

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Takagi (US Pat 5384587). Referring to claims 1-3, Takagi discloses an ink jet recording apparatus/method for effecting recording on a recording material by ejecting ink (See figure 1; column 1, lines 8-11), as well as a data processing method of processing data to be supplied to an ink jet recording apparatus for effecting recording on a recording material (See column 1, line 9; The disclosed generation of clear images represents a type of data processing method), both with relative scanning movement by ejecting ink with relative scanning movement between a recording head and the recording material (See figures 1-18; column 1, lines 29-34); an obtaining means/step for obtaining information indicative of an amount of ink to be ejected to each of unit areas provided by dividing an area in the neighborhood of a boundary between adjacent bands of scanning recording material (See figure 2, references 201 and 203; column 4, lines 63-64; column 5, lines 14-17; and column 7, lines 18-25); and a control means/step for controlling an amount of being to be ejected to the unit area on the basis of the output of the obtaining means (See figure 2, reference 201; column 4, lines 63-64; and column 7, lines 9-33),

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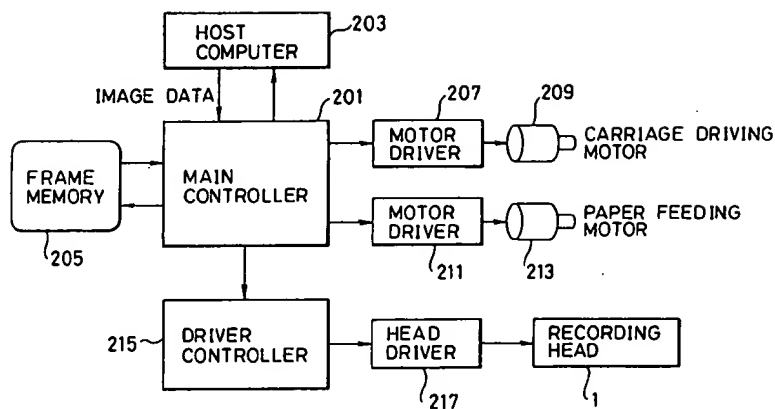


FIG. 2

wherein the unit areas astride the boundary between adjacent one of the bands (See figure 4; column 11, 47-53).

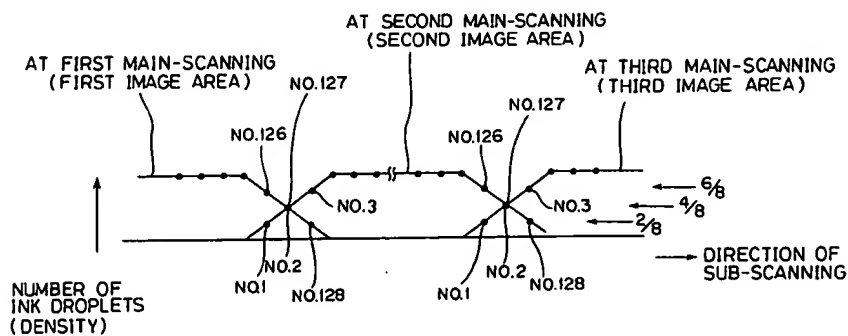


FIG. 4

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15. Claims 17-18, 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Takagi (US Pat 5384587). Referring to claims 17 and 21, Takagi discloses an ink jet recording apparatus for effecting recording by ejecting ink on a recording material on the basis of data using a recording head for ejecting the ink through a plurality of nozzles (See figure 1; column 1, lines 8-11), with the ink jet recording apparatus comprising a recording control means for imparting relative movement between the recording head and the recording material (See figure 2, references 201, 207, 209, 211, 213; column 7, lines 21-25) and rejecting thing from the recording head in accordance with the ink ejection data (see figure 2, references 201, 203, 205, 215, 217; column 7, lines 18-33) to sequentially effecting recording operations for adjacent recording areas by the ink ejected from the recording head (See figure 3, column 7, lines 37-68; column 8, lines 1-9); correcting means for counting data indicative of ejection of the ink for boundary areas of adjacent recording areas (See figure 2, references 201, 203; column 7, lines 17-21 [which discloses means of indicating image density]; column 8, lines 17-24 [which discloses that image density data is equivalent to the number (N') of ink droplets] - Thus correcting means for counting data are disclosed); and correcting means for reducing the ejection data for the boundary areas (See column 8, lines 21-24). As a result, referring to claim 21, Takagi also discloses a method of correcting image data for an ink jet recording apparatus.

Referring to claims 18 and 22, Takagi teaches that the counting means counts the data for each pixel (See column 8, lines 17-30). Therefore, if one pixel is counted individually, it is inherent that the data for an entire line of pixels is also counted. Takagi further describes how the correcting means correspond to each of the nozzles of the recording head effecting the recording for the boundary areas (See column 7, lines 17-59).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 4-6, 11, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (US Pat 5384587) in view of Nagoshi (US Pat 5359355).

Takagi discloses, with respect to claims 4-7, 11, and 13-14 an ink jet recording apparatus for effecting recording on a recording material by ejecting ink (See figure 1; column 1, lines 8-11) using a recording head having a plurality of recording elements (see column 1, lines 10-11), with the ink jet recording apparatus comprising: a recording scanning means for effecting recording with relative scanning movement between the recording head and the recording material in a main scan direction (See figures 1-18; column 1, lines 29-34) and a subscanning means for imparting relative scanning movement between the recording material and the recording head in a direction which is different from the main scan direction substantially each time after completion of recording scan in the main scan direction (See figures 1-18; column 1; lines 29-34), wherein the unit areas exist astride the boundary between adjacent one of the bands (See figure 4; column 11, 47-53).

Takagi differs from the claimed invention in that it does not explicitly disclose a dot count means for counting the ink ejection data number for each of the unit areas provided by dividing an area in the neighborhood of a boundary between adjacent bands of scanning recording of the recording head on the recording material. It also does not disclose that this dot count means counts the ink ejection data number with weighting for each of the bands, nor does it disclose that the dot count means counts the ink ejection data number with weighting which is different in the sub-scan direction. Nor does it explicitly disclose a determining means for determining a thinning rate for each of the unit areas on the basis of an output of the dot count means. Finally, Takagi does not explicitly disclose a thinning means for effecting a thinning process to the ink ejection data on the basis of the thinning rate determined by the determining means.

However, Takagi does teach, with respect to claims 4-6, 11, and 13 that "The number of ink droplets that may be landed on one pixel may be controlled based on the density data." (See column 4, lines 63-64). Furthermore, in regards to Figure 3, Takagi teaches "the number of ink droplets forming each pixel according to image data differs from each other." From the descriptions of figures 3 and 4, it is clear that each of the unit areas are divided in the

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neighborhood of a boundary between adjacent bands of scanning recording of the recording head on the recording material.

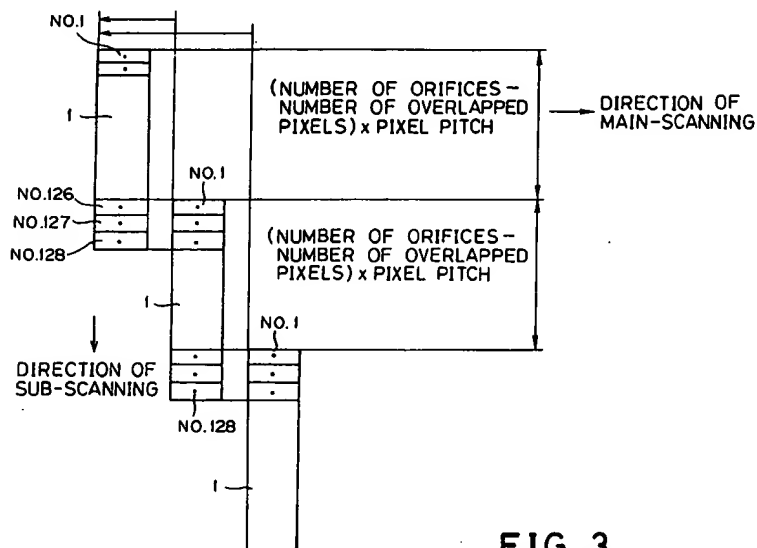


FIG. 3

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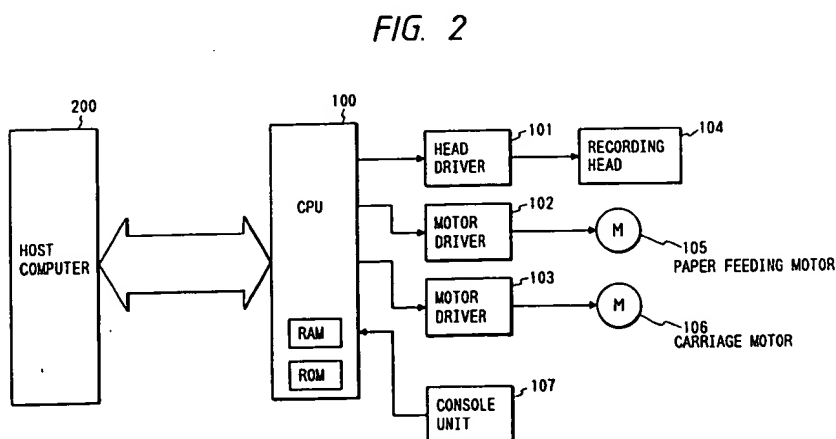
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Therefore, in order to properly enable the production of the different number of ink droplets that may be landed on one pixel, there must be an implicit means for counting the ink ejection data number. Thus, it will be assumed that Takagi implicitly implies a dot count means for counting the ink ejection data number for each of the unit areas provided by dividing an area in the neighborhood of a boundary between adjacent bands of scanning recording of the recording head on the recording material, though it does not explicitly state so. Furthermore, Takagi teaches, with respect to claim 5, "When recording is performed on the recording sheet at the first main-scanning time, the orifices Nos. 1, 2, ..., and 128 are used. At this time, as shown in FIG. 4, the numbers of ink droplets discharged from the orifices Nos. 126, 127 and 128 are determined as $N \times 6/8$, $N \times 4/8$ and $N \times 2/8$ respectively for forming the first image area." (See figures 3 and 4; column 7, lines 53-59) Here, the factors $6/8$, $4/8$, and $2/8$ represent different weights that are applied to the ink ejection bands. Next, Takagi teaches, with respect to claim 6, "a recording sheet is moved or sub-scanned upward by 125 pixels so that the orifices Nos. 1, 2, and 3 overlap part of the first image area formed by the orifices Nos. 126, 127 and 128 respectively..." (See

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figure 3; column 7, lines 60-64) Thus Takagi discloses that the dot count means not only counts the ink ejection data number with weighting for each of the bands, but it also counts the ink ejection data number with weighting which is different in the sub-scan direction.

Nagoshi teaches, with respect to claims 4, 11, and 13. "The CPU 100 controls the driving operation of the carriage motor 106 so that the single- and multi-pass print modes have different scan speeds. When the CPU 100 receives data from the host computer 200, it drives the carriage motor 106 to cause the carriage unit 2 to travel, thereby starting the main scan operation" (See figure 2, references 100, 106, and 200; column 4, lines 32-39). Thus, Nagoshi discloses a CPU 100, which not only receives data (i.e. dot count data [of which data about distance from boundary is inherent]) from the host computer, but also from that data, controls scanning speed, which directly relates to thinning rate in this invention. Thus Nagoshi discloses a determining means for determining a thinning rate for each of the unit areas on the basis of an output of said dot count means and a distance from the boundary.



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Nagoshi also discloses a thinning means for effecting a thinning process to the ink ejection data on the basis of the thinning rate determined by determining means (See abstract; figures 3-9 and 14-15; column 1, lines 60-68; and column 2, lines 34-42)..

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the determining and thinning means disclosed by Nagoshi into the ink jet recording apparatus disclosed by Takagi in order to perform thinning. The reason this is obvious is because though Takagi does not explicitly mention, "thinning", the scanning process it discloses would be considered "thinning" by one of ordinary skill in the art. Thus, the motivation of the skilled artisan in adopting the determining and thinning means disclosed by Nagoshi is to gain the benefit of being able to control thinning rate, thus reducing blurring and color mixing in the image.

17. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, in view of Nagoshi, as applied to claim 4 above, and further in view of Arai (EP Patent 0516420A2).

Takagi discloses, with respect to claim 7, a recording head, which ejects a plurality of **ink droplets** (See column 13, lines 58-59).

Takagi differs from the claimed invention in that it does not explicitly disclose that the recording head ejects a plurality of **inks**.

Arai does disclose a recording head, which ejects a plurality of inks (See column 7, lines 57-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to allow the recording head disclosed by Takagi to eject the plurality of inks disclosed by Arai in order to produce an image. The motivation for the skilled artisan in doing so is to obtain not only black and white images, but also color images, which are considered by many of ordinary skill in the art to be more aesthetically pleasing than black and white images.

18. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, in view of Arai (EP Patent 0516420A2).

Takagi discloses, with respect to claims 8-10, an ink jet recording apparatus/method for effecting recording on a recording material by ejecting ink (See figure 1; column 1, lines 8-11), as well as a data processing method of processing data to be supplied to an ink jet recording apparatus for effecting recording on a recording material (See column 1, line 9; The disclosed generation of clear images represents a type of data processing method), both with relative

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scanning movement by ejecting ink with relative scanning movement between a recording head and the recording material (See figures 1-18; column 1, lines 29-34); an obtaining means/step for obtaining information indicative of an amount of ink to be ejected to each of unit areas provided by dividing an area in the neighborhood of a boundary between adjacent bands of scanning recording material (See figure 2, references 201 and 203; column 4, lines 63-64; column 5, lines 14-17; and column 7, lines 18-25); and a control means/step for controlling an amount of being to be ejected to the unit area on the basis of the output of the obtaining means (See figure 2, reference 201; column 4, lines 63-64; and column 7, lines 9-33),

Takagi differs from the claimed invention in that it does not explicitly disclose that the inks of the unit area and the area to be thinned are different from each other.

Arai does disclose, "When different multi-pass intervals are set in correspondence with different colors "boundary blurring" can be more effectively prevented." (See column 9, lines 22-30). This implies that the inks of the unit area and the area to be thinned are different from each other.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Arai that the inks of the unit area and the areas to be thinned are different from each other into the ink jet recording apparatus/method and data processing method disclosed by Takagi in order to improve the thinning process. The motivation for the skilled artisan in doing so is to gain the benefit of more effectively preventing "boundary blurring", which is a problem familiar to one of ordinary skill in the art.

19. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, in view of Nagoshi, as applied to claim 11 above, and further in view of Matsubara (US Pat 5488398).

Takagi, in view of Nagoshi differs from the claimed invention in that it does not explicitly disclose that the thinning area is divided into a plurality of areas for each of which the thinning rate is determined.

Matsubara discloses, with respect to claim 12, a process of multi-scanning in a thinning area where part of the area is printed during the first scan and part of the area is printed during the second scan (See column 2, lines 17-23 and column 5, lines 21-32). This implies that the thinning area is divided into a plurality of areas, one area, which is printed upon during the first

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scan, the other area, which is printed upon during the second scan. Matsubara further discloses a “producing means for producing thinned recording data by thinning recording data supplied to said plurality of recording heads at a predetermined rate” (See column 10, lines 52-54), which implies that each of the plurality of areas within the thinning area had its own determined thinning rate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Matsubara that the thinning area is divided into a plurality of areas for each of which the thinning rate is determined, and said thinning means effects the thinning process on the basis of the thinning rate determined for each of the areas, into the apparatus disclosed by Takagi, in view of Nagoshi in order to improve the thinning process. The motivation for the skilled artisan in doing so is to gain the benefit of having an image with greater image quality, lacking in blurred colors, and other common problems known to one of ordinary skill in the art.

20. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, in view of Nagoshi, as applied to claim 14 above, and further in view of Lahut (US Pat 5070345).

Takagi, in view of Nagoshi, differs from the claimed invention in that it does not explicitly disclose that the area to be thinned is set only in one of the adjacent bands, nor does it explicitly disclose that the area to be thinned is set only in one of the bands adjacent a sheet discharging side.

Lahut teaches, with respect to claims 15 and 16, “In this way, any dot in a given row is printed only when either (1) there is no corresponding dot in two adjacent rows...” (See column 4, lines 44-46) Lahut’s reasoning for this procedure was to “prevent adjacent dot rows to fuse together forming a band of dots per pass.” (See column 5, lines 7-8) In the same way, this teaching shows that if an area to be thinned is set in two adjacent bands, banding will occur, which is the very problem that Takagi is trying to fix. Thus, Lahut does disclose that the area to be thinned is set only in one of the adjacent bands. Furthermore, Lahut discloses that “no two adjacent rows are printed during a pass of the print head in the same direction (See column 4, lines 53-68), which implies that the area to be thinned is set only in one of the bands adjacent a sheet discharging side.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Lahut that the area to be thinned is set only in one of the adjacent bands and one of the bands adjacent a sheet discharging side into the apparatus disclosed by Takagi, in view of Nagoshi in order to improve the thinning process. The motivation of the skilled artisan in doing so is to gain the benefit of a reduction in banding.

21. Claims 19 and 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, as applied to claims 2 and 22 above.

Takagi discloses a predetermined reduction amount (See column 8, lines 17-24).

Takagi differs from the claimed invention in that it does not disclose that the error between the predetermined amount and an actually reduced amount is added to an amount to be reduced for another line of pixels.

However, Takagi does disclose, with respect to claims 19 and 23, the ability to adjust for errors for each recording head (See column 8, lines 25-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to allow the error between the predetermined amount and an actually reduced amount to be added to an amount to be reduced for another line of pixels, as one means of the error adjustment disclosed by Takagi.

22. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi, as applied to claim 17 above, in view of Nagoshi.

Takagi discloses ink-jet recording (See column 1, lines 9-10).

Takagi differs from the claimed invention in that it does not explicitly disclose bubble ejection generated by thermal energy.

Nagoshi does disclose, with respect to claim 20, bubble ejection generation by thermal energy (See column 10, lines 18-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the teachings of Nagoshi to the apparatus disclosed by Takagi in order to create an ink jet recording apparatus wherein the recording head ejects by a pressure of a bubble generated by thermal energy. This is because it is well known to one of ordinary skill in

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the art that an ink-jet recording apparatus does eject bubbles generated by thermal energy. Thus, it is inherent to the apparatus disclosed by Takagi that it does eject by a pressure of a bubble generated by thermal energy.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nagoshi JP Patent 404366645A discloses an ink jet recorder.

Otsuka US Patent 6283569 discloses a recording method using large and small dots.

Katerberg US Patent 4920355 discloses an interlace method for scanning print head systems.

Furukawa US Patent 4272771 discloses an ink jet printer with multiple nozzle print head and interlacing or dither means.

Hirabayashi EP Patent 0526205A2 discloses an ink jet recording apparatus and method.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

lsl

May 2, 2002


John Barlow
Supervisory Patent Examiner
Technology Center 2800

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